ON THE AGROFORESTRY SYSTEM AND *IN SITU* CONSERVATION OF MEDICINAL PLANT GERMPLASM IN TRANS-NZOIA DISTRICT, KENYA

J. M. Ochora [1], ***J. M. Onguso*** [2] ***and J. I. Kany*** [3]
[1,3]Department of Botany, Jomo Kenyatta University of Agriculture and Technology, Nairobi
[2] Institute of Biotechnology Research, Jomo Kenyatta University of Agriculture and Technology, Nairobi
E-mail: jmemba@yahoo.com

Abstract
In sub-Saharan Africa about 80% of the ever increasing population depends on ethnomedicine for their healthcare since modern medicine is mostly expensive or unavailable in rural homesteads. However, ethnomedicine is the one presently recognised as the most effective in treating new emerging diseases such as HIV/AIDS since no effective conventional medicine exists for their cure. Medicinal plants germplasm, which are the major sources of ethnomedicine form an important part of forests and riverine vegetation in Kenya. These important plants include *Warburgia, Rhas* spp., *Aspilia, Acacia, prunus, Molinga*, *Brascae*, *Aloe*, and *Terminalia*. These plants are not only useful to man as a source of medicine but are microhabitats for many animals as well as forming "refugia" to many insects species. In Kenya, due to land degradation and rampant deforestation in agriculturally high potential areas, medicinal plants genetic resource is threatened. The most medicinally popular of these plant species, which are mostly biome restricted, are facing extermination. This paper reports conservation concerns in agriculturally high potential Trans-Nzoia District in Kenya. The study based on field surveys revealed that of the ca. 806 plants species in 92 families about 36 species are used for medicinal purposes. The plants are threatened in their indigenous localities in the District. The study recommends participatory *in situ* plant conservation in the District along maize and wheat farm hedges.

Key words: Agroforestry, *in situ* conservation, medicinal plants, indigenous medicines

1.0 Introduction

As the demand for arable land and urban settlement increases in Kenya, more of the existing forest land is being excised for use as farmlands and urban infrastructural expansion. These activities have led to clearing of important forests and game reserves. The forest depletion seems to relate very well with population pressure backed by the fact that the backbone of Kenya's economy is agriculture.

Although surveys to map the proportion of plant species that are lost each year have not been comprehensively carried out, it is not surprising to discover that an overwhelming number of plants especially those of medicinal importance is eroded.

As previously established, Kenya has a rich plant heritage with the most potent biochemicals (Kokwaro, 1983; Riley and Brokensha, 1988). Even if only a few medicinal plants have been documented for deforested areas of Kenya (Kanya 2004; Ochora *et al*., 2005) it is envisaged that many more destroyed plants fall under this category. *Ex situ* conservation strategies especially in garden environment (Frankel et al., 1995) are not suitable for trees and also for large populations of herbs, scrubs or shrub species.

2.0 Methods

2.1 Establishment of the Baseline and Number of Sampling (Transect Lines)

The transect intercept method *(Grieg-Smith, 1983)*of sampling was employed. At each sampling site, a 1 km baseline with a west-east orientation was established. These points were randomly placed along this baseline through which a sampling line (transect) passed. Three transect lines (each 50 m) were established which intersected the baseline at midpoints (William, 1986). The orientation for each transect was randomized by selecting a number between 0^{o} and 360^{o}.

2.2 Measurement on Each Baseline

As each line was traversed, the plants species intercepted by the transect line were identified to produce a species list (Agnew, 1994; Beetle, 1994). Where field identification of species was not possible in the field, voucher specimens were collected for later identification at the East African Herbarium (EA).

The field work was done for a period of one year during cropping and non-cropping seasons. In each sampling site in the farms a baseline, 1 Km. long, was established orientating in a west-east direction. Three random points were located along the baseline through which sampling line (transect) passed.
Transect lines were used such that as the line was traversed the plant species intercepted by the transect line were identified to produce a species checklist. The recorded plants were compared with the vegetation lists for Mt. Elgon forest available at the East African Herbarium. This montane vegetation is the remnant of indigenous plants of the District.

3.0 Results

A checklist of plants ca. 806 in 92 families was established (Table 1). Except for plants in the categories of herbs and scrubs that easily rejuvenate from propagules in the farmlands, most shrubs and trees earlier recorded for Trans-Nzoia District are of rare occurrence. Conspicuously absent were the highly medicinal plants such as *Warburgia*, *Prunus*, *Carissa*, and *Rhas* (Table 2) that were once dominant in the region.

Table 1: A checklist of plant species recorded in Trans-Nzoia District during cropping and non-cropping seasons

Family	Plant Species	Family	Plant Species
Acanthaceae	*Acanthus pubescens*	**Amaranthaceae**	*Achylanthes aspera*
	Asystasia mysorensis		*Amaranthus caudatus*
	Asystasia schimperi		*Amaranthus graecizana*
	Barleria micrantha		*Amaranthus hybridus*
	Dyschoriste radicans		*Celosia trigyna*
	Hygrophila auriculata		*Cyathula polycephala*
	Hypoestes forskahlii		
	Justicia exigua	**Amaryllidaceae**	*Scadoxus multiflorus*
	Justicia flava		
	Justicia striata	**Anacanthaceae**	*Rhus natalensis*
	Justicia whytei		*Rhus vulgaria*
	Monechma debile		
	Ruellia patula	**Anacardiaceae**	*Lannea edulis*
	Thunbergia elliotii		*Mangifera indica*
	Thunbergia gregorii *Tithonia aethiopica*		*Ozoroa insignis*
	Agave sisalan	**Annonaceae**	*Annona squamosa*
Anthericaceae	*Chlorophytum gallabatense*	**Apiceae**	*Sanicula elata*
Apocynaceae	*Carissa edulis*	**Araceae**	*Arisaema enneaphyllum*
	Landolphia buchananii		
Araliaceae	*Cussonia holstii*	**Aslepiadiaceae**	*Periploca linearifolia*
			Striga hermonthica
Asphodelaceae	*Bulbinella abyssinica*	**Asteraceae**	*Acanthospermum autriale*
Bignoniaceae	*Jacaranda mimosifolia*		*Acanthospermum glabratum*
	Markhamia lutea		*Acanthospermum hispidium*
	Spathodea campanulata		*Acmella calirhiza*
			Ageratina adenophora
Boraginaceae	*Cordia Africana*		*Ageratum conyzoides*
	Cynoglosum coeruleum		*Ageratum houstoniamum*
	Cynoglossum geometricum		*Anthemis tigreensis*
	Cynoglosum lanceolatum		*Artemisia afra*
	Ehretia cymosa		*Aspilia pluriseta*
	Trifolium burchellianum		*Bidens pilosa*
			Blumea aurita
Brassicaceae	*Crambe kilimandscharica*		*Balumea scaposa*
	Raphanus sativus		*Bothriocline tomentosa*
Bromeliaceae	*Ananas comosus*		*Centaurea mollis*
			Cirsium buchwaldii
Buddlejaceae	*Buddleja madagascariensis*		*Conyza aegyptiaca*
	Buddleja polystachya		*Conyza schimperi*
			Conyza stricta
Burseraceae	*Commiphora Africana*		*Conyza sumatrensis*
			Conyza volkensii
Caesalpiniaceae	*Chamaecrista hildebranditii*		*Crassocephalum afromontana*
	Chamaecrista mimosoides		*Crassocephalum mannii*

	Piliostigma thonningii		*Crassocephalum montuosum*
	Senna didymobotrya		*Crassocephalum picridifolium*
	Senna singueana		*Crassocephalum vitellium*
	Canjanus cajan		*Crepis carbonaria*
			Dichrocephala integrifolia
Capparaceae	*Cleome monophylla*		*Emilia discrifolia*
	Gynandropsis gynandra		*Euryops brownie*
			Galinsoga alba
Caricacea	*Carica papaya*		*Galinsoga parviflora*
			Gamolepis chrysanthemoifes
Caryophyllaceae	*Cerastium indicum*		*Gerbera viridifolia*
	Cerastium octandrum		*Gnaphalium luteo-album*
	Drymaria cordata		*Gnaphalium rubriflorum*
	Silene burchellii		*Guizotia scabra*
	Silene gallica		*Gutenbergia bonariensis*
	Basella alba		*Gutenbergia cordofolia*
			Helianthus annua
Casuarinaceae	*Cassuarina cannighamii*		*Helichrysum cymosum*
			Helichrysum cymosum
Calastraceae	*Maytenus heterophyla*		*Helichrysum formosissimum*
	Maytenus senegalensis		*Helichrysum gerberifolium*
			Helichrysum odoratissimum
Chenopodiaceae	*Chenopodium opulifolium*		*Helchrysum setosa*
	Chenopodium procerum		*Inula decipiens*
			Lactuca capensis
Compretaceae	*Compretum collinum*		*Lagascea alata*
	Compretum molle		*Lagascea mollis*
			Laggera brevipes
Commelinaceae	*Anailema johnsonii*		*Launaea cornuta*
	Commelina Africana		*Melanthera scandens*
	Commelina benghalensis		*Microglossa pyrifolia*
	Commelina repens		*Pycreus lanceolatus*
			Schkuhria pinnata
Convolvulaceae	*Convolvulus kilimandschari*		*Sigesbeckia abyssinica*
	Convolvulus mombasana		*Solanecio angulatus*
	Dichondra repenes		*Sonchus asper*
	Evolvulus alsinoides		*Sonchus oleraceus*
	Falkia canescens		*Sporobolus Africana*
	Ipomoea batatas		*Teclea nobilis*
	Ipomoea kituiensis		*Tithonia diversifolia*
	Ipomoea obscura		*Toddalia asiatica*
	Ipomoea purpurea		*Vernonia auriculifera*
			Vernonia brachytrichoides
Crassulaceae	*Bryophylum pinnatum*		*Vernonia galamensis*
	Kalanchoe densiflora		*Vernonia hymenolepis*
	Kalanchoe lanceolata		*Vernonia karaguensis*
	Kalanchoe mitejea		*Vernonia lasiopus*
			Vicia faba
Cruciferae	*Brassica integrifolia*	**Cupressaceae**	*Cupressus lustanica*

	Brassica juncea		
	Brassica nupus	**Cyperaceae**	*Bothrichloa inscupta*
	Brassica oleraceae		*Carex monostachya*
	Erucastrum arabicum		*Cyperus alba*
	Lepidium bonariense		*Cyperus assimilis*
			Cyperus bulbosa
Cucurbitaceae	*Coccinia grandis*		*Cyperus dichrostachyus*
	Cucumis aculeatus		*Cyperus distans*
	Cucurbita pepo		*Cyperusgiolii*
	Lagenaria abyssinica		*Cyperus hemisphaericus*
	Lagenaria sphaerica		*Cyperus immensis*
	Mormodica calantha		*Cyperus involucratus*
	Mormodica foetida		*Cyperus kilimandschari*
	Mormodica friesiorum		*Cyperus latifolius*
	Mukia maderaspantana		*Cyperus macrocephala*
	Peponium pepo		*Cyperus niveus*
	Peponium volgellii		*Cyperus obusiflorust*
	Zornia glochidiata		*Cyperus rigidifolius*
			Cyperus rohlfsii
Dennstaedtiacaea	*Hypolepis goetzei*		*Cyperus rotudus*
	Pteridium aquilinum		*Cyperus sieberiana*
			Cyperus tenuifolia
Dioscoreaceae	*Dioscorae schimperiana*		*Cyperus tomaiophyllus*
	Diospyros abyssinica		*Fimbristylis subaphylla*
	Euclea divonorum		*Fuirena leptostachya*
			Mariscus macrocarpa
Epacridaceae	*Richea albeltii*		*Schoenoplectus corymbosus*
			Schoenoplectus senegalensis
Euphobiaceae	*Acaclypha volkensii*		*Scleria racemosa*
	Clutia abyssinica		
	Clusia robusta	**Flacourtiaceae**	*Dovyalis caffra*
	Manhot esculenta		*Dovyalis macrocalyx*
	Phyllanthus fischeri		*Oncoba spinosa*
	Ricinus communis		*Triticum aestivum*
	Tribulus terrestris		
	Acalypha volkensii	**Gentianaceae**	*Syzygium cordatum*
	Croton macrostachyus		
	Croton megalocarpus	**Geraniaceae**	*Geranium arabicum*
	Erythrococca bongensis		*Pelargonium quinquelobatum*
	Euphorbia crotonoides		
	Euphorbia hirta	**Guttiferae**	*Hypericum peplidifolium*
	Euphorbia inaequilatera		
	Euphorbia prostrate	**Iridaceae**	*Gladiolus psittacinus*
	Euphorbia ugandensis		*Gladiolus ukambanensis*
	Phyllantus spp.		
	Flueggea virosa	**Labiatae**	*Achyrospermum schimperi*
	Sapium ellipticum		*Ajuga remota*
			Fuerstia Africana
Lauraceae	*Persea Americana*		*Hoslundica opposite*
			Lantana camara

Liliaceae	*Gloriosa surperba*		*Leonotis mollissima*
	Ornithogalum tenuifolium		*Leonotis nepetifolia*
	Aloe lateritia		*Leucas calostachys*
	Asparagus africanus		*Leucas deflexa*
			Leucas glandis
Loranthaceae	*Phragamanthera usuiensis*		*Leucas martinicensis*
			Leucas mollis
Malvaceae	*Abutilon longicuspe*		*Leucas neuflizeana*
	Abutilon mauritianum		*Ocimum gratissimum*
	Hibiscus calyphyllus		*Ocimum kenyense*
	Hibiscus cannabinus		*Ocimum kilimandscharicum*
	Hibiscus diversifolius		*Ocimum lamiifolium*
	Hibiscus fuscus		*Plectranthus barbatus*
	Hibiscus greenwayi		*Plectranthus edulis*
	Hibiscus rhomboidea		*Plectranthus laxiflorus*
	Hibiscus trionum		
	Hibiscus vitifolius		*Plectranthus parvus*
	Kosteletzkya adoensis		*Pycnostachys stuhlmannii*
	Malva verticillata		*Salvia merjamie*
	Pavonia patens		*Salvia microphylla*
	Pavonia urens		*Satureia biflora*
	Sida acuta		*Stephanie abyssinica*
	Sida Africana		
	Sida cordifolia	**Melastomataceae**	*Dissotis brazzae*
	Sida rhombifolia		
	Sida tenuicarpa	**Melastomaceae**	*Dissotis brazzae*
	Sida ternata		
Meliaceae	*Ekebergia capensis*	**Meliaceae**	*Ekebergia capensis*
Melianthaceae	*Bersama abyssinica*	**Menispermaceae**	*Cissampelos mucronata*
Mimosaceae	*Acacia albida*	**Musaceae**	*Enzete ventricosa*
	Acacia gerrardii		*Musa parasidiaca*
	Acacia hockii		*Musa sapiens*
	Acacia lahai		
	Acacia meansii	**Myrsinaceae**	*Embelia schimperi*
	Acacia nilotica		*Maesa lanceolata*
	Acacia sieberina		
	Calliandra caly	**Myrtaceae**	*Eucalyptus camaldulensis*
	Entada abyssinica		*Eucalyptus saligna*
	Albizia gumifera		*Psiadia guajava*
			Syzygium guineensis
			Tegetes minuta
Nyctaginaceae	*Bougaivillea spectabilis*	**Oleaceae**	*Fraxinus pennsylvanica*
			Jasminum fluminense
			Olea capensis
			Schrebera alata
Onagraceae	*Jussiaea abyssinica*		
	Ludwigia abyssinica	**Oxalidaceae**	*Oxalis corniculata Oxalis*

			latifolia
			Oxalis obliquifolia
Palmae	*Phoenix reclinata*		
		Passifloraceae	*Passiflora edulis*
Papilionaceae	*Alysicarpus glumaceus*		
	Antopetitiana abyssinica	**Pedaliaceae**	*Sesamum angolensis*
	Astragalus atropilosulus		*Sesamum calycimum*
	Caesalpinia decapetala		
	Cassia mimosoides	**Phytolaceae**	*Phytolacca dodecandra*
	Cassia obtusifolia		
	Crotalaria brevidens	**Plantaginaceae**	*Plantago lanceolata*
	Crotalaria hyssopifolia		*Plantago palmate*
	Crotalaria incana		
	Crotalaria incanum		
	Crotalaria recta	**Poaceae**	*Sorgum vulgare*
	Crotalaria spinosa		*Andropogon abyssinicus*
	Desmodium adscendens		*Aristida adoensis*
	Desmodium intortum		*Beckeropsis uniseta*
	Desmodium repandum		*Bothriochloa inscupta*
	Desmodium uncintortum		*Bothriocline longipes*
	Dichrostachys cinerea		*Brachiaria brizantha*
	Eriosema macrostipulum		*Brachiaria decumbens*
	Eriosema pauciflorum		*Chloris gayana*
	Erythrina abyssinica		*Chloris pycnothrix*
	Glycine whytei		*Cymbopogon caesius*
	Indigofera arrecta		*Cymbopogon diplandra*
	Indigofera fischeri		*Cymbopogon dissolute*
	Indigofera mimosoides		*Cymbopogon nardus*
	Indigofera nairobiensis		*Cynodon dactylon*
	Indigofera spicata		*Dactyloctenium aegyptium*
	Indigofera volkensii		*Digitaria scalarum*
	Leucaena glauca		*Digitaria ternate*
	Phaseolus vulgaris		*Digitaria velutina*
	Pisum sativum		*Echinochloa pyramidalis*
	Pseudarthria hookeri		*Echinochloa haploclada*
	Pterolobium stellatum		*Eleusine coracana*
	Rhynchosia elegans		*Eleusine glaucum*
	Rhynchosia kilimandscharica		*Eleusine indica*
	Rhynchosia minima		*Eleusine jaegeri*
	Rhynchosia parkeri		*Eragrostis aspera*
	Sesbania sesban		*Eragrostis brownie*
	Tephrosia holstii		*Eragrostis ciliaris*
	Thalictrum rhyncocarpum		*Eragrostis exasperate*
	Trifolium usambarensis		*Eragrostis humidicola*
	Trimeria grandifolia		*Eragrostis pellucidus*
	Typha domingensis		*Eragrostis rigidifolius*
	Vigna monophyla		*Eragrostis tenuifolia*
	Vigna parkeri		*Floscopa glomerata*
	Viola abyssinica		*Harpachne schimperi*
	Zornia setosa		*Hyparrhenia collina*

			Hyparrhenia cymbarica
Polygalaceae	*Polygala sphenoptera*		*Hyparrhenia filipendura*
	Fallopia convolvus		*Hyparrhenia hirta*
	Oxygonum sinuatum		*Hyparrhenia rufa*
	Polygonum nakuruense		*Hyperthelia dissolute*
	Polygonum nepalense		*Imperata cylindrical*
	Polygonum pulchrum		*Leersia hexandra*
	Polygonum salicifolium		*Loudetia kagerensis*
	Polygonum senegalensis		*Microchloa kunthii*
	Rumex abyssinica		*Oplismenus hirtellus*
	Rumex bequaertii		*Panicum deustum*
			Panicum maximum
Portulaceae	*Portulaca oleraceae*		*Panicum pyramidalis*
	Portulaca quadrifida		*Paspalum auriculatum*
			Paspalum commersoni
Proteaceae	*Grevillea robusta*		*Paspalum scrobiculatum*
			Pennisetum cladestinum
Ranunculaceae	*Clematis brachiata*		*Pennisetum giganteum*
	Ranunculus multifidus		*Pennisetum polystachya*
	Thea sinensis		*Pennisetum purpureum*
			Pennisetum squamulatum
Resedaceae	*Caylusea abyssinica*		*Pennisetum trachyphyllum*
			Rhynchelytrum repens
Rhamnaceae	*Gouania longispiculata*		*Saccharum officinarum*
	Helinus mystacinus		*Setaria plicatilis*
	Scutia myrtina		*Setaria pumila*
			Setaria sphacelata
Rosaceae	*Alchemilla johnstonii*		*Setaria verticilata*
	Alchemilla kiwuensis		*Sorghastrum rigidifolium*
	Eriobotrya japonica		*Sorghastrum stiopoides*
	Prunus Africana		*Sorghum arundinaceum*
	Rubus pinnatus		*Sporobolus pellucidus*
	Rubus scheffleri		*Sporobulus pyramidalis*
	Rubus steudneri		*Stachys aculeolata*
			Thunbergia alata
Rubiaceae	*Coffea Arabica*		*Triumfetta annua*
	Galium spurium		*Zehneria scabra*
	Kohautia coccinia		*Zea mays*
	Oldenlandia herbacea		
	Pentanicia ouranogyne	**Rutaceae**	*Citrus limon*
	Pentas longiflora		*Tephrosia hildebrandtii*
	Richardia brasiliensis		*Torilis arvensis*
	Rubia cordifolia		
	Spermacoce princeae	**Solanaceae**	*Datura metel*
	Sphaeranthus bullatus		*Datura stramonium*
	Vangueria madagascariensis		*Lycoperscon esculentum*
	Verbena bonariensis		*Nicandra physalodes*
			Physalis peruviana
Sterculiaceae	*Dombeya burgessiae*		*Solanum aculeastrum*
	Dombeya torrida		*Solanum anguivi*

			Solanum incanum
Theaceae	*Camelia sinensis*		*Solanum nigrum*
	Themeda triandra		*Solanum schumannianum*
			Solanum teberosum
Tiliaceae	*Corchorus trilocularis*	**Typhaceae**	*Typha domingensis*
	Grewia bicolor		
	Grewia similis	**Ulmaceae**	*Celtis africana*
	Spermannia ricinocarpa		
	Triumfetta macrophylla	**Umbelliferae**	*Agrocharis incognita*
	Triumfetta rhomboidea		*Apium leptophylum*
	Tylosema fassoglensis		*Centella asiatica*
			Erythroselinum atropurpareum
Verbenaceae	*Clerodendrum myricoides*		*Hydrocotyle ranunculoides*
	Clerodendrum rotundifolium		*Oreoschimperella aberdarensis*
	Lippia javanica		
	Priva curtisiae		*Tragia brevipes*
	Verbena brasiliensis		
	Vernonia amygdalina		
	Cissus oliveri		
	Cyphostemma kilimandschari		
	Cyphostemma serpens		
	Rhoicissus tridentate		
Urticaceae	*Girardinia diversifolius*	**Zygophyllaceae**	*Trichodesma zeylanicum*
	Laportea alatipes		
	Pouzolzia parasitica		
	Urtica massaica		
	Vangueria infuasta		

Table 2: Some medicinal plants of Trans-Nzoia District

Botanical name (Family) and part(s) used
1. *Acacia* spp. (Fabaceae): Bark 2. *Aloe* spp. (Aloeceae): Leaves and tuberous roots 3. *Asparagus Africana* (Asparagaceae): Tuberous roots 4. *Balanites glabra* (Balanitaceae): Bark 5. *Carissa edulis* (Apocynaceae): Roots 6. *Catharanthus* spp. (Apocynaceae): Leaves 7. *Psidium guajava* (Myritaceae): Leaves 8. *Coleus* spp. (Lamiaceae): Leaves 9. *Commiphora* spp. (Burseraceae): Bark 10. *Erigeron* spp. (Asteraceae): Leaves 11. *Fagara* sp. (Rutaceae): Bark 12. *Ipomoea* sp. (Convovulaceae): Tubers 13. *Leonotis* spp. (Lamiaceae): Leaves 14. *Kigeria Africana* (Bignoniaceae): Bark and Fruit

15. *Melia volkensii* var. *keniae* (Meliaceae): Leaves and Bark
16. *Mimosa pudica* (Fabaceae): Leaves
17. *Omocarpum trichicarpum* (Fabaceae): Bark
18. *Pappea capensis* (Spindaceae): Bark
19. *Prunus africana* (Rosaceae): Bark and Leaves
20. *Rhoicissus tridentate* (Vitaceae): Tubers
21. *Sterculia africana* (Sterculiaceae): Bark
22. *Striga hermonthica* (Scrophuriacaee): Whole plant
23. *Synadenium campactum* (Euphorbiaceae): Leaves
24. *Urtica massaica* (Urticaceae): Leaves
25. *Warburgia ugandensis* (Canellaceae): Bark, Leaves and Fruit
26. *Ximeria caffra* (Olelaceae): Bark
27. *Ajuga ramota* (Hypericaceae): Leaves
28. *Opuntia* Sp. (Cactaceae): Fruits
29. *Vernonia* spp. (Asteraceae): Leaves
30. *Albizia* spp. (Mimosaceae): Bark
31. *Euphorbia hirta* (Euphorbiaceae): Whole plant
32. *Rhus* spp. (Anacardiaceae): Bark
33. *Aspilia* spp. (Asteraceae)
34. *Senna* spp. (Fabaceae)
35. *Terminalia* spp.(Compretaceae): Bark
36. *Centaurea mollis* (Asteraceae): Leaves

4.0 Conclusion

Based on the fact that many medicinal plants are threatened in Trans-Nzoia District conservation measures should be put in place to ensure survival of this important germplasm (Kanya et al., 2004). Participatory *in situ* conservation of medicinal plants though a fairly new concept in Kenya should be emphasized for application by land owners as it is practical and sustainable. To achieve this objective plant nursery of selected indigenous medicinal plants enlisted in Table 2 with known uses by traditional healers should be emphasized. The seedlings then should be supplied to farmers to plant either as hedge plants or along the farm boundaries to serve as wind breakers and a source of herbs for traditional healers and pharmaceutical companies. However, other modes of *in situ* conservation can be explored for plants listed in Table 1.

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